110

QC1- Inspect dimensions to dimension sheet

0.00

Memo

Duality Control

0.00

| NCR: | Yes | 1 | No |
|------|-------|---|-----|
| IVI | 1 - > | , | 134 |

WORK ORDER NON-CONFORMANCE / UPDATE

| DQA Stark | Date: 12/16/01 | * | |
|-----------|----------------|---|--|
| , | | 1 | |

| | | | | | <u>-</u> . | | | | | QA Closed: | Date: | Ч | |
|--|--|---|------------|----------|--|---|--|---|---------------------------|---|---|---------------------------------------|--|
| Work Orde | er: | 89 | 878 | } | · | DISPOSITION | | AGAINST DEPARTMENT/PROCESS | | | | | |
| Part N | Part No. <u>D</u> 206-667-247TRA NCR No. <u>12-1853</u> | | | TRN | Rework Scrap Use-as-is Work Order Update | // I | Skid-tube Machining noforming Large Fab | Water Jet d. Eng. Coor. re/Packaging Supplier | Engineering Quality Other | | | | |
| Root | | | | | Descri | Lption of work order update | Initial | Act | ion | Sign & | | | |
| Cause | | Date | Step | Qty | | or Non-conformance | Chief Eng | Descr | ription | Date | Verification | QC Inspector | |
| Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training | X | Mario | 100 | 1 | 0.11 | taper or half use out of tol. under by approx. 0.007" | | Acceptable affectived | | 12/9/20 | 12-9-20 | 745 16 17 69/28 | |
| Unapproved | | | | <u> </u> | | | ALUIT CATE | CORY | | | | | |
| t and t | | | | | | | AULT CATE | GORY | | | | | |
| Landi | | Bending Centre No Cracks Crushed/(| | | o/s | General Bend BOM/Route Broken/Damaged Burrs | _ | ion Incomplete | | Ovalized Over/Under Part incorred | ct | Pressure/Forced Temperature/Cure Weld | |
| | | Cuffs Heat Trea Inspection | t | | | Contamination Countersink Cut Too Short | Mainte Mislabe | eled | Jnclear | Part Lost/Mi Part Moved Positioned V Power Loss/ | Vrong | Wrong Stock Pulled Other | |
| | _ | Ripples in | | | | Drill Holes | Offset | - | · <u>L</u> | - , | WG+ Strice | | |
| | $\boldsymbol{\vdash}$ | Torque W | | xtrusior | , | Drawing | | Calibration | | PURITION | <u> </u> | 3.4/ | |
| | _ | Turning Se | | | | Finish | ⊢ | Sequence | | | *************************************** | | |
| | | Wave/Twi | ist in Tub | e | | Folio | Outside | Dimensions | | | | | |

| Work Ord Wednesday, Sep | | 9878 012 9:50:40 AM | | *898 | 378* | | | | | | | Page 2 | |
|--------------------------------|--------------|---------------------------|----------------------|----------------------|-----------|--------|--------------|--------------|--------------|-------|------------------|----------------|--|
| Item ID: Revision ID: | D206-667-2 | 47TRN | | Accept | *N900 | 040 | 100 |)* | Setup | Start | *N | S1* | |
| Item Name: | Crosstube As | sembly, Mid Aft | | | | | | | | Stop | *N. | S2* | |
| Start Date: | 9/12/2012 | Start Qty: 1.00 | *1* | | Cust Item | ID: | | | | | | | |
| Required Date Reference: | : 9/24/2012 | Req'd Qty: 1.00 | *1* | | Customer: | | | | | | | | |
| Approvals: | Process Plan | an: | Date: | Tooling: | D | ate: | | | Run | Start | *N | R1* | |
| | QC: | • | Date: | SPC (Y/N): | D | Date: | | | | Stop | *N | R2* | |
| Sequence ID/ Work Center I | D | Operation Description | | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accep Qty | t Rej Qty | | Reject Number | Insp. Stamp | |
| *120 | | MORI SEIKI CNC LAT | HE LARGE | 0.00 | | | | | | | • | | |
| Mori Seiki | | Memo | | 0.00 | | | , | | | | | | |
| Mori Seiki CNC La | athe Large | 2-File down | | | | | | | | | · · | 12/09 | |
| 130 | | QC1- Inspect dimension | s to dimension sheet | 0.00 | | | | | | | | | |
| *130* QC | | Memo | | 0.00 | | | | | | | - | | |
| Quality Control | • | | ~ | | | | | | | | | CAPAR | |
| | | | | | | | | | | ٠ | | 12/09/1 | |
| 140 | | QC8- Inspect parts - seco | ond check | 0.00 | | | | | | | | | |
| *14 0 * | | Memo | | 0.00 | | , . | | TW | | | 2-9-2 | 26 | |

Quality Control

| NCR: | 'es | / No | | | | WORK ORDER NON-O | CON | NFORM | MANCE / UP | DATE | | | F., |
|--------------|------|------------|------------|----------|-------------|--------------------------------|-----|----------|------------------------|------------------------|---------------|----------------------------|---------------------|
| | | | | | | | | | | | QA Closed: | Date: | |
| Work Orde | er: | | | | | DISPOSITION | | | | AGAINST DE | PARTMENT/ | | , |
| Part N | 10. | | | | | Rework Scrap | | | Skid-tube Machining | Crosstube Small Fab | - | Water Jet I. Eng. Coor. | Engineering Quality |
| NCR I | 10. | | | | | Use-as-is Work Order Update | | | noforming Large Fab | Finishing Composite | Rec/Stor | e/Packaging Supplier | Other |
| Root | | | | | Descri | iption of work order update | | nitial | Ac | tion | Sign & | | |
| Cause | | Date | Step | Qty | | or Non-conformance | Ch | ief Eng | Desc | ription | Date | Verification | QC Inspector |
| oc/Data | | | | | | | | | | | | | |
| quip/Tooling | | | | | | | | | | | | | |
| perator | | | | | | | | | | | | | |
| /laterial | | | | | | | | | | | | | |
| etup | | | | | | | | | | | | | |
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| upplier | | | | | | | | | - | | | | |
| raining | | | | | | • | 1 | | | | | | |
| Inapproved | | | | | | | | | | | | , | |
| | | | | | | | AUL | T CATE | GORY | , | | | |
| Landi | ng (| 1 | | | | General | | , | | | 7 | م | - |
| | | Bending | | | _ | Bend | | Grain | | | Ovalized | <u> </u> | Pressure/Forced |
| | | Centre No | t Concer | ntric to | o/s | BOM/Route | | Hardwa | re | _ | Over/Under | | Temperature/Cure |
| | | Cracks | | | L | Broken/Damaged | | Inspect | on Incomplete | | Part Incorred | t | Weld |
| | | Crushed/0 | Crimped. | | | Burrs | | Instruct | ions Incomplete/ | 'Unclear | Part Lost/Mi | ssing | Wrong Stock Pulled |
| | | Cuffs | | | | Contamination | | Mainte | nance | | Part Moved | | * |
| | | Heat Trea | t | | | Countersink | | Mislabe | led | | Positioned V | /rong | |
| | | Inspection | Strip in | Tube | | Cut Too Short | | Misread | i | | Power Loss/ | Surge | Other |
| | | Ripples in | Bend | | | Drill Holes | | Offset | | | | | * |
| | | Torque W | aves in E | xtrusio | 1 | Drawing | | Out of (| Calibration | | | | ; |
| | | Turning Se | equence | | | Finish | | Out of S | Sequence | | | | |
| | | Wave/Twi | ist in Tub | e | | Folio | Г | Outside | Dimensions | | | | |

DQA:

Date:

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Identify and stock in kanban rack

Location: L

Packaging

| | | | | | | | | | | | | DQA: | Da | te: | |
|---|-----|--|------------------------------|-----|--------|---|-----|--|--|---|-----|---|---|-----|--|
| NCR: | Yes | / No | | | | WORK ORDER NON-C | 100 | NFORM | ANCE / UP | DATE | | _ | | | |
| | | | | | | | | | · | | Q | A Closed: | Da | te: | |
| Work Ord | er. | | | | | DISPOSITION | | : | | AGAINST DE | EP# | ARTMENT/ | PROCESS | | |
| Part I | | | | | | Rework Scrap Use-as-is Work Order Update | | f Therm | Skid-tube Machining noforming Large Fab | Crosstube Small Fab Finishing Composite | | | Water Jet d. Eng. Coor. e/Packaging Supplier | | Engineering Quality Other |
| Root | | | | | Descri | ption of work order update | 1 | Initial | Act | ion | | Sign & | | | |
| Cause | | Date | Step | Qty | (| or Non-conformance | Cr | nief Eng | Descr | iption | L | Date | Verificatio | n | QC Inspector |
| Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved | | | | | | | | | | | | | | | |
| | | | | | | | AUI | LT CATE | GORY | | | | | | |
| Landi | | Bending Centre No Cracks Crushed/ Cuffs Heat Trea Inspection | Crimped. It n Strip in | | o/s | General Bend BOM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short | | Instruct Mainte Mislabe Misread | on Incomplete ions Incomplete/U nance led | Jnclear | PPP | Ovalized Over/Under Part Incorrect Part Lost/Mile Part Moved Positioned W | ct ssing Vrong | | Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other |
| 1 | i i | Ripples in | Bend | | Į | Drill Holes | | Offset | | | | | | | |

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

Folio

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

| Work Ord Wednesday, Sep | | 9878 012 9:50:40 AM | | *89878* | | | | | | | | Page 4 |
|---|--------------------------|---|--------------------|------------------------------|--------------------------|------------|--------------|---------------|------------|---------------|------------------|-------------------------|
| Item ID: Revision ID: Item Name: | D206-667-2 | 47TRN sembly, Mid Aft | | Accept | *N900 | 040 | 100 |)* | Setup | Start Stop | 1 13 | S1* S2* |
| Start Date: Required Date Reference: | 9/12/2012 : 9/24/2012 | Start Qty: 1.00 Req'd Qty: 1.00 | *1* *1* | | Cust Item I Customer: | D: | | | | | | |
| Approvals: | QC: | | Date: | Tooling: SPC (Y/N): | | ate: | | | Run | Start Stop | ! | R1* R2* |
| Sequence ID/ Work Center I 180 *180* QC Quality Control | D | Operation Description QC21- Final Inspection Memo | Work Order Release | Set Up/ Run Hours 0.00 | Tool ID Tool # | | Plan Code | Accept Qty | Rej Qty | 12 | Reject Number | Insp. Stamp 28 200-27 |

| | | | | | | | | | | | | DQA: | Dat | :e: | 1 |
|---|-----|---|------------------------------|-----|--------|---|-----|--|--|---|-----------------------------|---|--|-----|--|
| NCR: | Yes | / No | | | | WORK ORDER NON-C | :01 | NFORM | MANCE / UPI | DATE | QA | Closed: | Dat | te: | á . |
| Work Ord | er: | | | | | DISPOSITION | | | | AGAINST DE | PAR | TMENT | /PROCESS | | |
| Part I | No. | Des | | | | Rework Scrap Use-as-is Work Order Update | | Therm | Skid-tube Machining noforming Large Fab | Crosstube Small Fab Finishing Composite |] | | Water Jet d. Eng. Coor. re/Packaging Supplier | | Engineering Quality Other |
| Root | | | | | Descri | ption of work order update | ı | nitial | Act | ion | Si | gn & | | | |
| Cause | | Date | Step | Qty | (| or Non-conformance | Ch | ief Eng | Descr | iption | 1 | Date | Verification | n_ | QC Inspector |
| Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved | | | | | | | | | | | | | | | |
| | | | <u> </u> | | | | AUL | T CATE | GORY | | | | | | |
| Landi | | Bending Centre No Cracks Crushed/ Cuffs Heat Trea Inspectio | Crimped. at n Strip in | | o/s | General Bend BOM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short | | Instruct Mainte Mislabe Misreac | on Incomplete ions Incomplete/U nance led | Jnclear | Part Part Part Pos | er/Under t Incorre t Lost/M t Moved itioned V | issing Vrong | | Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other |
| 1 | 1 | Ripples in | Bend | | | Drill Holes | 1 | Offset | | | | | | | |

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

Folio

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Picklist Print

Wednesday, September 12, 2012 9:50:44 AM

Work Order ID: 89878

89878

Parent Item:

D206-667-247TRN

Parent Item Name: Crosstube Assembly, Mid Aft

D206-667-247TRN

Start Date: 9/12/2012

Required Date: 9/24/2012

Page 1

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP rev:A 11.01.06 new issue DD verf:EC

| Component Item ID/ Item Name | Replacement Item ID | Mfg/ Purch | Bin Item | Primary Location | Last Location | Route Seq ID | Unit of Measure | Qty on Hand | Qty per Kit | Total Qty | Qty Issued | Date Issued | Status |
|------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|
| D6004-115 | | Manufactured | No | | | 100 | Each | 68.0000 | 1 | 1 | | | |
| *D6004-11 | 15* | | | | | | | | ** | | | | |

Crosstube Material

| Location | Loc Qty | Loc Code |
|----------|---------|----------|
| LG | 68 | |
| 34685 | l | |
| 69795 | 30 | |
| 75636 | 37 | |

I mm. L 12/09/18

| NCR: | Yes | 1 | Nο |
|------|-----|---|----|

| NCR: Y | 'es | / No | | | | WORK ORDER NON-C | CON | NFORN | MANCE / UPI | DATE | QA Closed: | Date: | |
|--------------|----------|--------------------------|------------|-------------|--|--|----------|-------------------|---------------------------------------|-------------|---------------------------------------|------------------|---------------------------------------|
| | | | | | | DISPOSITION | | | · · · · · · · · · · · · · · · · · · · | AGAINST DE | · · · · · · · · · · · · · · · · · · · | <u> </u> | |
| Work Orde | er: _ | | | | | | . | | | AOAMSI DE | | _ | |
| | | | | | | Rework | | | Skid-tube | Crosstube | | Water Jet | Engineering |
| Part N | ١o. | | | | | Scrap | | | Machining | Small Fab | ł | d. Eng. Coor. | Quality |
| | | | | | | Use-as-is |] | i e | noforming | Finishing | Rec/Stor | e/Packaging | Other |
| NCR N | ۱o. - | | | | ······································ | Work Order Update | | | Large Fab | Composite | | Supplier | |
| Root | | | | | Descri | ption of work order update | 1 | nitial | Act | ion | Sign & | • | |
| Cause | | Date | Step | Qty | | or Non-conformance | Ch | ief Eng | Descr | ription | Date | Verification | QC Inspector |
| oc/Data | | | | | | | | | | | | • | ĺ |
| quip/Tooling | | | | | | | | | | | | | |
| perator | | | | | | 1 St | | | | | } | | |
| //aterial | | | | | | | | | | | | | |
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| | | | | | | | AUL | T CATE | GORY | | | | · · · · · · · · · · · · · · · · · · · |
| Landi | _ | 1 | | | | General | | ا ما | • | | 1 | | 7 |
| | ${f -}$ | Bending | | | <u> </u> | Bend | - | Grain | | <u></u> | Ovalized | - - | Pressure/Forced |
| | - | Centre No | ot Concer | itric to | U/S - | BOM/Route | - | Hardwa | • | | Over/Under | | Temperature/Cure |
| | \vdash | Cracks | د | | · - | Broken/Damaged | - 2 | 4 : | on Incomplete | | Part Incorred | | Weld |
| | _ | Crushed/(Cuffs | crimpea. | *** | ₹×. | Burrs | - | 1 | ions Incomplete/L | Unclear | Part Lost/Mi | ssing | Wrong Stock Pulled |
| | | Heat Trea | | | *** <u> </u> | Contamination Countersink | - | Mainte Mislabe | | · | Part Moved | ulas a s | V |
| % 437 - 1 | \vdash | | | Tubo | <u> </u> | | \vdash | | | _ | Positioned W | | Jour . \ |
| * | | Inspection Ripples in | | i ube | - | Cut Too Short Drill Holes | \vdash | Misread Offset | ı | <u> </u> | Power Loss/ | onike | Other ¹ |
| | _ | Torque W | - * | vtrucio | <u>,</u> | Drawing | \vdash | h. | Calibration | | | | |
| | | Turning So | | .ALI USIO | " ├- | Finish | | 4 | Sequence | | | | |
| | | Wave/Tw | - | ٠ | - | Folio | \vdash | 1 | Dimensions | | | | |
| | | yvave/ IW | ist ni Tub | / て | | TI OHO | | Louiside | Dimensions | | | | 1 |

DQA:

Date:

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

| DART AEROSPACE LTD | Work Order: | 89878 |
|--|--------------|-----------------|
| | | |
| Description: Crosstube Assembly, Mid Aft | Part Number: | D206-667-247TRN |
| | | |
| Inspection Dwg: D206-667-247 Rev: A | | Page 1 of 2 |

FIRST ARTICLE INSPECTION CHECKLIST

| Inspection Sheet Drawing Dimension | | Tolerance | Actual Dimension | Accept | Reject | Method of Inspection | Comments |
|---------------------------------------|-------------|---------------|---------------------|--------|--------|-------------------------|----------|
| | 2.490 | +0.005/-0.000 | 2.493 | / | | vern | CNC608 |
| | 2.025 | +0.005/-0.000 | 2.030 |) | |) | |
| | 2.079 | +0.005/-0.000 | 2.084 | ~ | | | |
| | 2.145 | +0.005/-0.000 | 2.150 | | | | |
| | 2.209 | +0.005/-0.000 | 22/4 | | | | |
| | 2.287 | +0.005/-0.000 | 2-252 | / | • | | |
| V | 2.363 | +0.005/-0.000 | 2368 | 1 | | V . | |
| SIDE | | | | - | | | |
| S | 0.200 | +/-0.010 | 266 |) | | vern | CNC-US |
| | R0.063 | +/-0.010 | ,063 | / | | R6 | |
| | R2.00 | +/-0.010 | -266 | 1 | | 11 | |
| | R0.063 | +/-0.010 | -063 | | | ((| |
| | 4.438 | +/-0.010 | 4.438 | / | | vern | CNC-CG |
| | | | | | | | |
| | | | | | | | |
| | 2.490 | +0.005/-0.000 | 2.485 | | _ | vers | CNC-08 |
| | 2.0250.004 | +0.005/-0.000 | 7.021 | | _ | 1 | |
| | 2.079 0.603 | +0.005/-0.000 | 2.676 | | / | | |
| | 2.145 0.04 | +0.005/-0.000 | 2-141 | | | | |
| | 2.209 6,003 | +0.005/-0.000 | 2-206 | | | | |
| | 2.287 0,004 | +0.005/-0.000 | 2.283 | 1/1 | _ | | |
| 8 | ى، ھ 2.363 | +0.005/-0.000 |) 358 | | / | 1 | |
| SIDE | | | | | | | |
| S | 0.200 | +/-0.010 | 1200 | | | 11211 | CNL -08 |
| | R0.063 | +/-0.010 | .063 | / | | RG | |
| | R2.00 | +/-0.010 | 2.60 | | | 11 | |
| | R0.063 | +/-0.010 | 063 | / | | .) | |
| - | 4.438 | +/-0.010 | 4.476 | 7 | | vern | 0000 |
| | | | | | | | |
| | | | | | | | |
| | 99.76 | +/-0.020 | 99.756 | | | tope" | 6-22 |

| NCR: | Yes | 1 | No |
|---------|-----|---|-----|
| INC.IV. | 153 | , | INC |

| | | | | | | | | | | | DQA: | Date: | | |
|-------------|------|------------|---------------------------------------|-----------|-----|-------|----------------------------|----------|-----------------|-------------------------|--------------|------------------|--------------------|--|
| NCR: ' | ⁄es | / No | | | | | WORK ORDER NON-C | O | NFORM | MANCE / UPDATE | | | | |
| | | | | | | | | | | | QA Closed: | Date: | | |
| Vork Ord | er: | | | | | | DISPOSITION | | | AGAINST DE | PARTMENT | PARTMENT/PROCESS | | |
| voin ora | ••• | | | | | | Rework | | | Skid-tube Crosstube | 7 | Water Jet | Engineering | |
| Part No. | | | | Scrap | | . 1 | Machining Small Fab | Pro | d. Eng. Coor. | Quality | | | | |
| | | | | Use-as-is | | Thern | noforming Finishing | Rec/Stor | e/Packaging | Other | | | | |
| NCR 1 | ۱٥. | | | | | | Work Order Update | | | Large Fab Composite | | Supplier |] [] | |
| Root | | | | | Des | crii | otion of work order update | | nitial | Action | Sign & | | | |
| Cause | | Date | Step | Qty | | | or Non-conformance | 1 | ief Eng | | Date | Verification | QC Inspector | |
| oc/Data | | | · · · · · · · · · · · · · · · · · · · | , | | | | | | | | | | |
| uip/Tooling | | | | | | | | | | | | | | |
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| upplier | | | | | | | • | | | | | | | |
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| napproved | | | | | | | | | | | | | | |
| | | | | | | | F/ | AUL | T CATE | GORY | | | | |
| Landi | ng (| ear | | | | | General | | | | | | _ | |
| | | Bending | | | | _ | Bend | | Grain | L | Ovalized | | Pressure/Forced | |
| | | Centre No | ot Concer | ntric to | o/s | | BOM/Route | _ | Hardwa | · } | Over/Under | — | Temperature/Cure | |
| | | Cracks | | | | _ | Broken/Damaged | L | 1 ' | ion Incomplete | Part Incorre | | Weld | |
| | | Crushed/0 | Crimped. | | | | Burrs | ldash | 4 | ions Incomplete/Unclear | Part Lost/Mi | ssing | Wrong Stock Pulled | |
| | | Cuffs | | | | | Contamination | L_ | Mainte | - | Part Moved | | | |
| | | Heat Trea | | | | L | Countersink | \vdash | Mislabe | | Positioned V | | ¬ | |
| | | Inspection | | Tube | | L | Cut Too Short | \perp | Misread | d | Power Loss/ | Surge | Other | |
| | | Ripples in | | | | _ | Drill Holes | <u> </u> | Offset | | | | | |
| | | Torque W | | | n | L | Drawing | <u>_</u> | 4 | Calibration | | | | |
| | | Turning Se | equence | | | L | Finish | L | Out of Sequence | | | | | |

Outside Dimensions

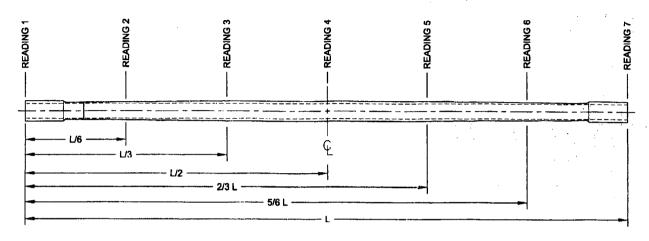
Wave/Twist in Tube

Folio

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

| DART AEROSPACE LTD | Work Order: | 89878 |
|--|--------------|-----------------|
| Description: Crosstube Assembly, Mid Aft | Part Number: | D206-667-247TRN |
| Inspection Dwg: D206-667-247 Rev: A | | Page 2 of 2 |

WALL THICKNESS MEASUREMENT



| | WALL | THICKNESS | Deviation | | | | |
|----------------------|-------|-----------|-----------|------|-----------------|-----------|--|
| Location | w1 | w2 | w3 | w4 | Δw (max-min) | TOLERANCE | |
| READING 1 L= 0" | 351 | .348 | .351 | .359 | .611 | | |
| READING 2 | . 156 | .158 | ,152 | .155 | .006 | | |
| READING 3 | ~247 | .237 | ,230 | 243 | -017 | | |
| READING 4 L= 49 | .362 | 351 | -350 | 364 | 1014 | 0.045" | |
| READING 5 | .231 | .728 | -235 | .245 | .017 | | |
| READING 6 L= (| .150 | .147 | -148 | .158 | .0(1 | | |
| READING 7 L= CUFF | 349 | .746 | 346 | -352 | -006 | | |

Calibration Result

Actual Block Thickness: 100-500

Sitescan 250 Measured Thickness:

| Measured by: mm(| Audited by: | Preliminary Approval: | |
|------------------|---------------|-----------------------|--|
| Date: 12/09/19 | Date: 12-9-20 | Date: | |

| Rev | Date | Change | Revised by | Approved |
|-----|----------|---------------------------|------------|----------|
| Α | 11.06.21 | New Issue | KJ | |
| В | 12.02.02 | Dimension 4.438 was 4.500 | KJ , Λ | |
| С | 12.06.01 | Wall thickness form added | KJ OH | 137 |

| | | | | | | | | | DQA: | Date: | |
|--------------|----------|------|-----|--------------------------------------|-----------|------------|--|---|------------|---|---------------------------|
| NCR: Yes | / No | | | WORK ORDER N | ION-COI | NFORN | MANCE / UP | | QA Closed: | Date: | |
| Work Order: | | | | DISPOSITIO | V | | | AGAINST DE | PARTMENT | PROCESS | |
| Part No. | | | | Rew So Use-a Work Order Upo | crap s-is | N Therm | Skid-tube Machining noforming Large Fab | Crosstube Small Fab Finishing Composite | | Water Jet d. Eng. Coor. re/Packaging Supplier | Engineering Quality Other |
| Root | | | | Description of work order up | date | Initial | Act | tion | Sign & | | |
| Cause | Date | Step | Qty | or Non-conformance | Ch | nief Eng | Desc | ription | Date | Verification | QC Inspector |
| Doc/Data | | | | | | | | | | | |
| quip/Tooling | | | | | | • | | | | | |
| Operator | | | | | | | | | | | |
| Material | | | | | | ļ | | | | | |
| Setup | | | | | | | | | | | |
| Other | 1 | | | | | | | | | | |
| Process | | | | | | | | | | | |
| Supplier | | | | | | | | | | | |
| Training | 1 | | | | | | | | | | |
| Jnapproved | 1 | | | | | | | | | | |
| | <u>*</u> | * | • | | FAUL | T CATE | GORY | | | * | |

| Landing | Gear | General | _ | | _ |
|---------|------------------------------|----------------|---------------------------------|----------------------|--------------------|
| | Bending | Bend | Grain | Ovalized | Pressure/Forced |
| | Centre Not Concentric to O/S | BOM/Route | Hardware | Over/Under tolerance | Temperature/Cure |
| | Cracks | Broken/Damaged | Inspection Incomplete | Part Incorrect | Weld |
| | Crushed/Crimped. | Burrs | Instructions Incomplete/Unclear | Part Lost/Missing | Wrong Stock Pulled |
| | Cuffs | Contamination | Maintenance | Part Moved | _ |
| | Heat Treat | Countersink | Mislabeled | Positioned Wrong | _ |
| | Inspection Strip in Tube | Cut Too Short | Misread | Power Loss/Surge | Other |
| | Ripples in Bend | Drill Holes | Offset | | |
| | Torque Waves in Extrusion | Drawing | Out of Calibration | | |
| | Turning Sequence | Finish | Out of Sequence | | |
| Γ | Wave/Twist in Tube | Folio | Outside Dimensions | | |

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| Item | Qty -247 | Part Number | Description |
|------|-------------|----------------|---|
| 1 | х | D206-667-247 | CROSSTUBE ASSEMBLY (206L MID AFT) |
| 2 | 1 | D6004-115 | CROSSTUBE |
| 3 | 2 | D2873-043 | NUT PLATE |
| 4 | 2 | D2873-045 | NUT PLATE |
| _ 5 | 2 | D2892-1 | SUPPORT |
| 6 | 4 | D3595-063-450 | RUBBER CUSHION |
| 7 | 4 . | MS21920-22 | CLAMP |
| 8 | 14 | MS20601AD4W10 | RIVET (OR NAS9302B-4-10) |
| 9 | A/R | MAGNOBOND 6398 | ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTROMBELL SPEC, 299- 947-100, TYPE II, CLASS 2 ADHESIVE) |

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6004-115 FINISHED LENGTH = 99.76±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2 PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D206-667-247" AND BATCH NUMBER ON INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS).
- WEIGHT: 21.1 lbs (-607 = 17.7 lbs)
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 10 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 11) INSTALL D2892-1 SUPPORT USING 0.03° TO 0.06° THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-22 CLAMPS WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2892-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS ARE LOCATED ON CROSSTUBE SUPPORTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TOROLLING

598180918

DEO ATTACHED

600 # (1 - 615 11.07.24

UNDER/REVIEW

В

| Α | NEW IS | SSUE | | CP | 10.12.23 | | |
|-------------------------------------|--------|------|--|------------------------|------------------------|--|--|
| REV. | | | DATE | | | | |
| DESIGN | | P. | DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA | | | | |
| DRAWN | | 92 | | | | | |
| CHECKE | D. | | DRAWING NO. | 1. | REV. A | | |
| MFG. AF | PR. | 0- | D206-667-247 SHEET | | | | |
| APPRO\ | ÆD . | who | TITLE | | SCALE | | |
| DE APPR. CROSSTUBE ASSY (206L MID A | | | | 06L MID AF | T) NTS | | |
| DATE | 10.1 | 2.23 | COPYRIGHT © 2010 BY THIS DOCUMENT IS PROMITE AND CONSIDERING AND INCOME OF COPIED ON WATTER PERSONS AND ANY PURPOSE OR COPIED ON WATTER PERSONS AND ANY PURPOSE OF ANY PURP | STUPPLIED ON THE EDDRE | S CONDITION THAT IT IS | | |

| | | | | | | | | | | | DQA: | Date: | |
|---------------|---------------|----------|--------------|----------|---------|----------------------------|---------|---------|------------|------------|------------|---------------|------------------|
| NCR: Y | 'es | / No | | | | WORK ORDER NON-O | 100 | VFOR | MANCE / UP | DATE | | | • |
| | | | | | | · | | | | | QA Closed: | Date: | |
| Work Orde | or. | | | | | DISPOSITION | | | | AGAINST DE | PARTMENT, | /PROCESS | |
| 1 | | | | | | Rework | 1 | | Skid-tube | Crosstube | | Water Jet | Engineering |
| Part N | lo. | | | | | Scrap | 1 | i i | Machining | Small Fab | Pro | d. Eng. Coor. | Quality |
| | _ | | | | | Use-as-is | | | noforming | Finishing | 4 | re/Packaging | Other |
| NCR N | ١o. | | | | | Work Order Update | | | Large Fab | Composite | | Supplier | |
| | | | | | | | | | | | _ | | |
| Root | | | |] | Descri | ption of work order update | | Initial | Ad | ction | Sign & | | |
| Cause | \perp | Date | Step | Qty | (| or Non-conformance | Ch | ief Eng | Desc | cription | Date | Verification | QC Inspector |
| Doc/Data | | | | | | | | | | | : | | |
| Equip/Tooling | | | | | | | | | | | | | |
| Operator | | | | | | | | | | • | | | |
| Material | _ | | | | | | | | | | | | ł |
| Setup | | | | | | | | | | | | | |
| Other | _ | | |] | | | | | | | | | |
| Process | _ | | İ | | | | | | | | | | |
| Supplier | | |] ; | | | | | | | | | | |
| Training | _ | · | | | | | | | | | | | |
| Unapproved | | | <u> </u> | İ | | | | | | | | | |
| <u> </u> | | | | | | | AUI | T CATE | GORY | | | | |
| Landir | | | | | | General | _ | 1 | | | 7 | | , |
| | \bigsqcup ' | Bending | | | <u></u> | Bend | \perp | Grain | | | Ovalized | | Pressure/Forced |
| 1 | l la | entre No | ot Concer | atric to | o/s l | BOM/Route | 1 | Hardwa | ire | | Over/Under | tolerance | Temperature/Cure |

Inspection Incomplete

Maintenance

Out of Calibration

Out of Sequence

Outside Dimensions

Mislabeled

Misread

Offset

Instructions Incomplete/Unclear

Part Incorrect

Part Moved

Part Lost/Missing

Positioned Wrong

Power Loss/Surge

Weld

Other

Wrong Stock Pulled

Broken/Damaged

Contamination

Countersink

Cut Too Short

Drill Holes

Drawing

Finish

Folio

Burrs

Ripples in Bend

Turning Sequence

Wave/Twist in Tube

Cracks

Cuffs

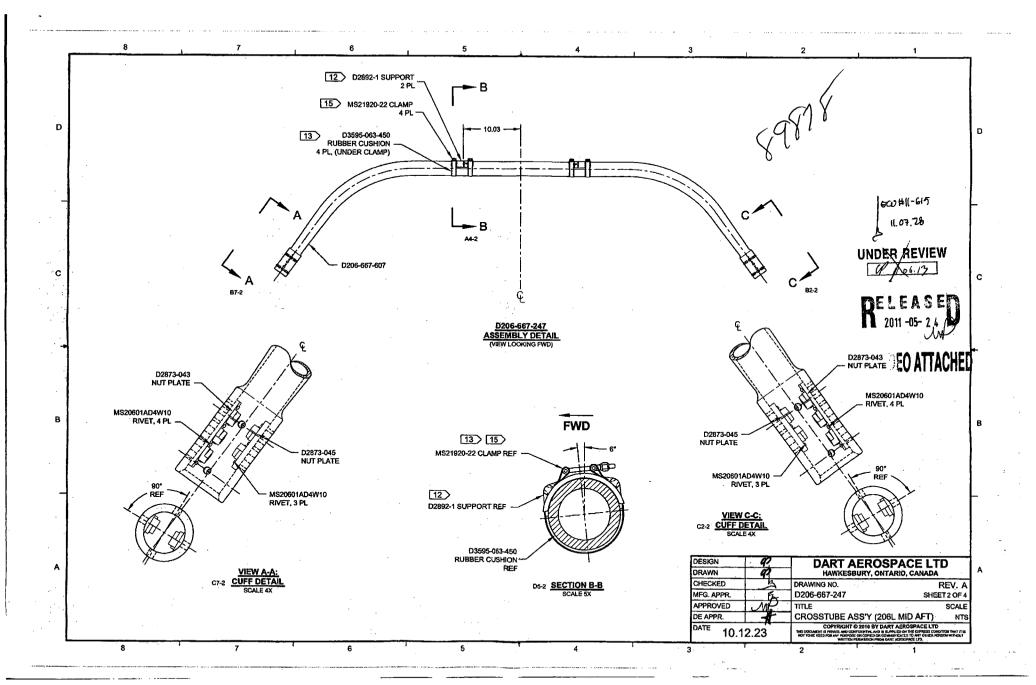
Heat Treat

Crushed/Crimped.

Inspection Strip in Tube

Torque Waves in Extrusion

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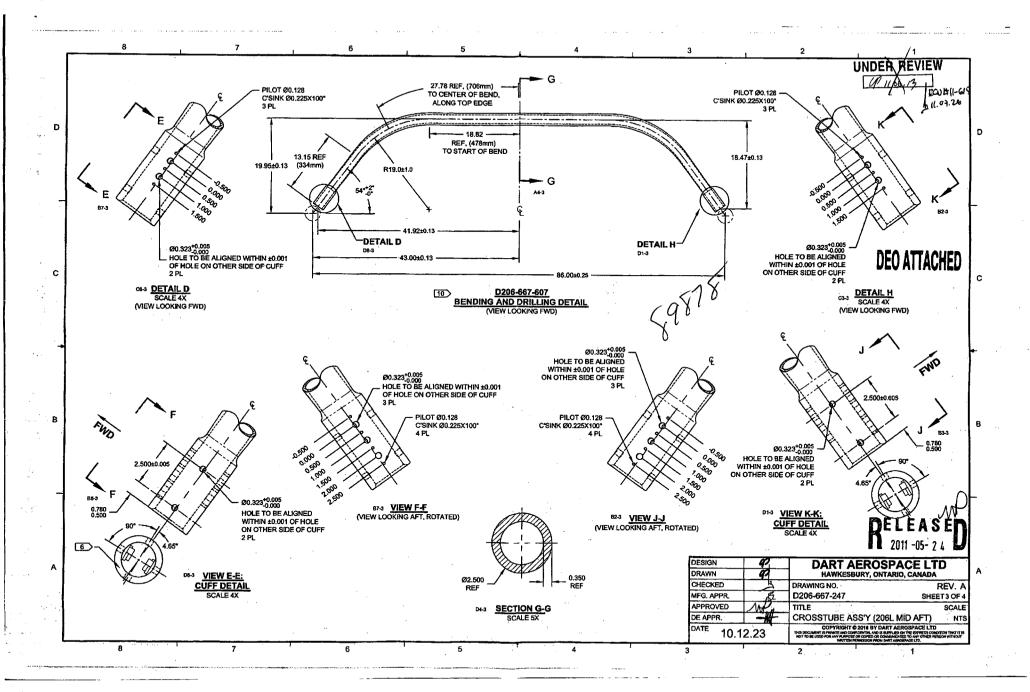


| NCR: | Yes | / | No |
|------|-----|---|----|
| | | • | |

| NCR: | CR: Yes / No WORK ORDER NON-CONFORMANCE / UPDATE QA Closed: Date: | | | | | | | | | | | | |
|-------------------------------------|--|------------|----------|----------|--------|--|----------|--------------------|------------------|---|---------------|--------------|--------------------|
| Work Orde | er: | | | | | DISPOSITION | | | | AGAINST DE | | .==== | |
| Part I | ۱٥٠ ِ | | | | | Rework Skid-tube Crosstube Machining Small Fab Use-as-is Thermoforming Finishing Composite | | | | Water Jet Engineering Prod. Eng. Coor. Quality Rec/Store/Packaging Other Supplier | | | |
| Root | | | | | Descri | iption of work order update | l | nitial | Ac | tion | Sign & | | |
| Cause | | Date | Step | Qty | | or Non-conformance | Ch | ief Eng | Desc | ription | Date | Verification | QC Inspector |
| oc/Data | | | | | | | | | <u> </u> | | | | |
| quip/Tooling | | | | | | | | | | | | | |
| perator | | | | | | | | | | | | | |
| laterial | | | | | | | | | | | | | |
| etup | | | | | | | | | | | | | |
| ther | | | | | | | | | | | | | |
| rocess | | | | | | | | | | | | | |
| upplier | | | | | | | | | | | | | |
| raining | | | | | | | 1 | | | | | | |
| napproved | | | | | | | | | | | | | |
| | | | | | L | F | AUL | T CATE | GORY | | | | \ |
| Landi | ng (| Gear | | | | General | | ··· - | | <u> </u> | | | |
| | _ | Bending | | | Γ | Bend | | Grain | | | Ovalized | | Pressure/Forced |
| | | Centre No | t Concer | ntric to | o/s | BOM/Route | | Hardwa | re | . [| Over/Under | tolerance | Temperature/Cure |
| | | Cracks | | | | Broken/Damaged | | Inspecti | on Incomplete | | Part Incorred | | Weld |
| | | Crushed/0 | Crimped. | | | Burrs | | 1 | ions Incomplete/ | /Unclear | Part Lost/Mi | ssing | Wrong Stock Pulled |
| | | Cuffs | • | | | Contamination | | Mainte | • | ļ | Part Moved | | , , |
| | Heat Treat | | | | | Countersink | | Mislabe | • | · | Positioned V | √rong | |
| | | | | | | Cut Too Short | | Misread | | | Power Loss/ | | Other |
| | | Ripples in | | | | Drill Holes | | Offset | | L | | | |
| | | Torque W | | xtrusio | n | Drawing | | ł | Calibration | | | | |
| | | • | | | | Finish | | i | Sequence | | | | |
| Turning Sequence Wave/Twist in Tube | | | | | | Folio | | Outside Dimensions | | | | | |

DQA: Date:

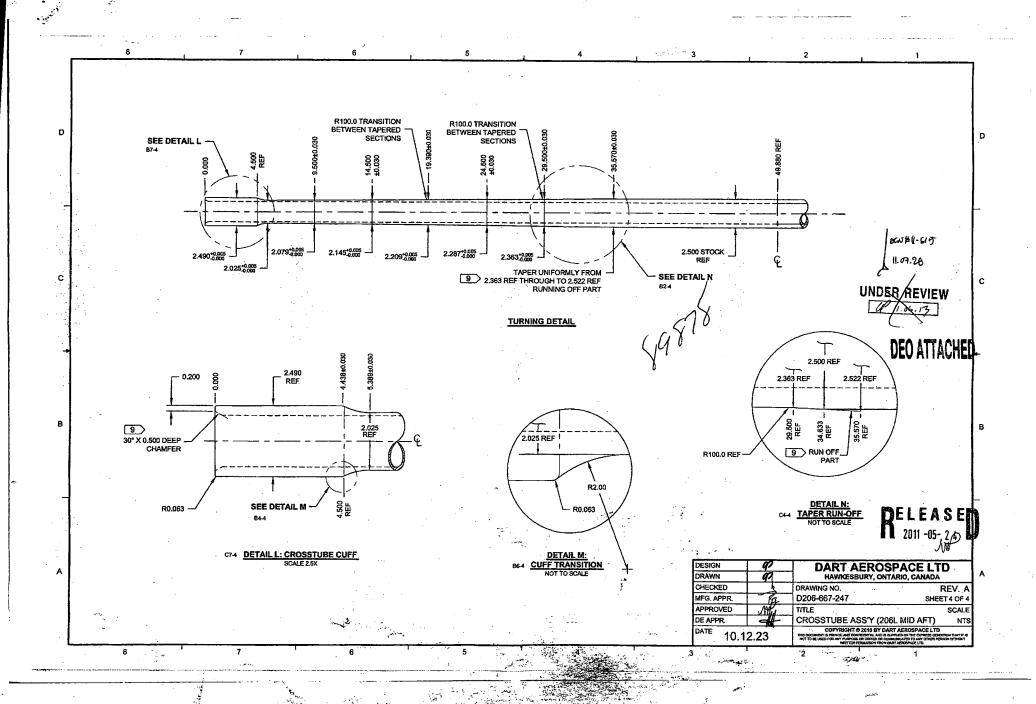
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| | | | | • |
|--------------|-------------------------------------|------|-------|---|
| | | DQA: | Date: | - |
| | | | | |
| JCR Yes / No | WORK ORDER NON-CONFORMANCE / UPDATE | | | |

| rven. | C3 / 14 | | | | , | Work on ben non c | | | | QA Closed: | Date | : |
|---------------------------------------|--------------------------|----------|-------|-----------|---------------|--------------------------------|-----------|---------------------|------------------------|--------------|--------------------------|--|
| Work Orde | er: | | | | | DISPOSITION | | | AGAINST DE | PARTMENT, | PROCESS | |
| | | | | | | Rework | | Skid-tube | Crosstube | | Water Jet | Engineering |
| Part N | lo | | | | | Scrap | | Machining | Small Fab | l | d. Eng. Coor. | Quality |
| NCR N | lo | | | | - | Use-as-is Work Order Update | Ther | moforming Large Fab | Finishing Composite | Rec/Stoi | re/Packaging Supplier | Other |
| Root | | | | | Descri | ption of work order update | Initial | Act | ion | Sign & | | |
| Cause | Dat | e St | tep | Qty | (| or Non-conformance | Chief Eng | Descr | ription | Date | Verification | QC Inspector |
| Doc/Data | | | | | | | | | | | | |
| Equip/Tooling | | | | : | | | | | | | | |
| Operator | | | | | | | | | | | | |
| Material | • | | 1 | | | | 1 | | | | | |
| Setup | | | | | | | | | | | | |
| Other | | - | | | | | | | | | | |
| Process | | | | | | | | | • | | | |
| Supplier | | | 1 | | | | | | | | | |
| Training | | | 1 | 1 | | | | | | | | |
| Unapproved | | | | | | | | | | | | |
| · · · · · · · · · · · · · · · · · · · | | | | | | F/ | AULT CAT | EGORY | | | | |
| Landir | ng Gear | | | | | General | _ | | | • | | - |
| | Bendi | • | | | | Bend | Grain | | | Ovalized | L | Pressure/Forced |
| | Centre | Not Co | oncen | tric to (| D/S | BOM/Route | Hardw | are | | Over/Under | tolerance | Temperature/Cure |
| | Cracks | ; | | | | Broken/Damaged | Inspec | tion Incomplete | <u> </u> | Part Incorre | ct _ | Weld |
| | | ed/Crim | ped. | | | Burrs | Instruc | ctions Incomplete/I | Unclear | Part Lost/M | issing | Wrong Stock Pulled |
| 1 | Cuffs | | | | | Contamination | Maint | enance | | Part Moved | | |
| 1 | Heat 1 | reat | | | | Countersink | Mislab | eled | | Positioned \ | Vrong | |
| | Inspection Strip in Tube | | | L | Cut Too Short | Misrea | | | Power Loss/ | Surge | Other | |
| 1 | _ | s in Ben | | | L | Drill Holes | Offset | | | | | ······································ |
| ļ | _ | e Wave: | | xtrusior | ۰ <u> </u> | Drawing | Out of | Calibration | | | | |
| | | g Seque | | | L | Finish | Out of | Sequence | | | | |
| | Wave/Twist in Tube | | | | | Folio | Outsid | e Dimensions | | | | |

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| | | | | | | | | | | | DQA: | Date | : . |
|---|---|------------|------------|--|----------|----------------------------|---|----------------------------|-------------------------|--|---------------------------|--------------|--------------------|
| NCR: \ | ⁄es | / No | | | | WORK ORDER NON-C | O | NFORM | MANCE / UPDATE | | • | | • |
| | | • | | | | | | | | | QA Closed: | Date | : |
| Work Orde | er. | | | - | | DISPOSITION | | AGAINST DEPARTMENT/PROCESS | | | | | |
| Part N | Part No. NCR No. Date Step Qty Data Coot Indianal Coot Indianal Coot Indianal Coot Indianal Coot Indianal Coot Indianal Coot Indianal Coot Indianal Coot Indianal Coot Indianal Coot Indianal Coot Indianal Coot Indianal Coot Indianal Coot Indianal Coot Indianal Coot Indianal Coot Indianal | | | Rework Scrap Use-as-is Work Order Update | | Therm | Skid-tube Crosstub Machining Small Fa noforming Finishin Large Fab Composit | b g | 4 | Water Jet d. Eng. Coor. e/Packaging Supplier | Engineering Quality Other | | |
| Root | | | | , and the second | Descri | ption of work order update | 1 | nitial | Action | | Sign & | | |
| Cause | | Date | Step | Qty | C | or Non-conformance | Ch | ief Eng | Description | | Date | Verification | QC Inspector |
| Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved | | | | | | | | | | | | | · |
| | | | | | | F <i>F</i> | AUL | T CATE | GORY | | | | |
| Landi | $\overline{}$ | | | | | General Bend | | Grain | | | Ovalized | | Pressure/Forced |
| | - | - | ot Concer | ntric to | o/s | BOM/Route | | Hardwa | re | | Over/Under | tolerance | Temperature/Cure |
| | ${f}$ | | | | | Broken/Damaged | | 4 | on Incomplete | \vdash | Part Incorre | | Weld |
| | П | Crushed/6 | Crimped. | | | Burrs | П | 4 | ions Incomplete/Unclear | | Part Lost/Mi | issing | Wrong Stock Pulled |
| | | | | Contamination | \vdash | Mainte | • | | Part Moved | - L | - | | |
| | П | Heat Trea | it . | | | Countersink | Г | Mislabe | eled | | Positioned V | Vrong | |
| | П | Inspection | n Strip in | Tube | | Cut Too Short | | Misread | · j | | Power Loss/ | · - | Other |
| | П | Ripples in | Bend | | | Drill Holes | Г | Offset | · . | - | _ | _ | |

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

Folio

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| DRAWING NO. | TITLE | | REV. A | DART A | EROSPACE LTD | D.E.O. NO | • | SHE | ET NO. | SCALE |
|--------------|---------|-----------------|---------|------------|---------------------|-----------|-----------|---------|-----------|-------|
| D206-667-247 | CROSSTU | BE ASSY (206L M | ID AFT) | ENGINE | ERING ORDER | D206-66 | 7-247-A-1 | SHE | ET 1 OF 1 | NTS |
| DRAWN | P | CHECKED AS | > | MFG. APPR. | <i>i</i> (3) | APPROVED | IMP | DE APPR | # - | |
| DATE 11. | 07.15 | DATE 11.07 | 1.20 | DATE | 11.07.21 | DATE | 11/07/21 | DATE | 11.07-21 | |

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

| Item | Qty -247 | Part Number | Description |
|------|-------------|-----------------|-------------------------------|
| | | | |
| _ 9 | A/R | PROSEAL 890 B-2 | SEALANT, AMS-S-8802 CLASS B-2 |

WAS:

| 9 | A/R | MAGNOBOND 6398 | ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II. CLASS 2 ADHESIVE) |
|---|-----|----------------|---|

NOTE 12 & 15. SHEET 1 IS AMENDED AS FOLLOWS:

12

- 12) TO INSTALL D2892-1 SUPPORT: ABRADE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

WAS:

- 12) INSTALL D2892-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.





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BE USED FOR ANY PURPOSES OR COMPED OR COMMISSION THE DID ANY DIFFER PERSON WITHOUT

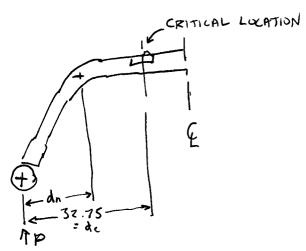
BY USED FOR ANY PURPOSES.

| | | | | | | | | | | | | DQA: | Date: | : |
|--------------|--|------------|------------|----------|-----|-------------|----------------------------|--------------------|--------------------|---------------------|--------------|---------------|---------------------------------------|--------------------|
| NCR: | ⁄es | '/ No | | | | | WORK ORDER NON-C | ON | NFORM | MANCE / UPDA | TE | _ | - | . • |
| | WORK ORDER NON-CONFORMANCE / UPDATE Order: DISPOSITION AGAINST DEPARTMENT/PROCESS Prod. Eng. Coor. Quality Other | | | | | | | | | | | | | |
| Nork Ord | er: | - | | | | | DISPOSITION | | | | AGAINST DE | PARTMENT/ | PROCESS | |
| | • | | | | | | Scrap | | ſ | Machining | Small Fab | | l. Eng. Coor. | Quality |
| NCR I | No. | | | | | | | | - | | - | | | |
| Root | | | | | Des | crip | otion of work order update | 1 | nitial | Action | า | Sign & | | |
| Cause | | Date | Step | Qty | 14 | | • | Ch | ief Eng | Descript | tion | | Verification | QC Inspector |
| oc/Data | | | | | | | | | | • | | | | |
| quip/Tooling | | | | | | | | | | | | | | ` |
| perator | | | | | | | | | | | | | | |
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| raining | | | | | | | | | | · | | | | |
| napproved | | | | | | | | | | | | | | • |
| | | | | | | | F/ | AUL | T CATE | GORY | · | ^ | | |
| Landi | ng (| Gear | | | | | General | | | | | | | |
| | | Bending | | | | | Bend | | Grain | • | | Ovalized | | Pressure/Forced |
| | | Centre No | t Concer | ntric to | o/s | | BOM/Route | | Hardwa | re | | Over/Under | tolerance | Temperature/Cure |
| | | Cracks | | | | | Broken/Damaged ं ू | | Inspecti | on Incomplete | | Part Incorrec | t | Weld |
| | | Crushed/0 | Crimped. | | | | Burrs | - 340 | Instruct | ions Incomplete/Unc | clear | Part Lost/Mi | ssing | Wrong Stock Pulled |
| | | Cuffs | | | | | Contamination | | Mainte | nance | | Part Moved | | - |
| | anding Gear Bending Centre Not Concentric to O/S Cracks Crushed/Crimped | | | | | Countersink | | Mislabe | led | | Positioned W | /rong | | |
| | | Inspection | Strip in | Tube | | | Cut Too Short | | Misread | 3 | | Power Loss/S | | Other |
| | Ripples in Bend Drill Ho | | | | | | Drill Holes | | Offset | | I | • | | |
| | | Torque W | aves in E | xtrusio | า | | Drawing | Out of Calibration | | | | | | |
| | | Turning Se | equence | | | | Finish | | Out of S | sequence | | | · · · · · · · · · · · · · · · · · · · | |
| | | Wave/Twi | ist in Tub | e · | • | | Folio | Г | Outside Dimensions | | | | | |

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DZ06-667-297 B/N 89878

| LOCATION | ACTUAL | | | Moment | |
|----------|--------|-------|---------|--------|-------|
| | OD | ID | Inertia | Arm | M.S. |
| 2.500 | 2.500 | 1.800 | 1.402 | 32.750 | N/A |
| 2.363 | 2.358 | 1.800 | 1.002 | 22.621 | 0.097 |
| 2.287 | 2.283 | 1.800 | 0.818 | 17.749 | 0.179 |
| 2.209 | 2.206 | 1.800 | 0.647 | 13.217 | 0.296 |
| 2.145 | 2.141 | 1.800 | 0.516 | 9.636 | 0.461 |
| 2.079 | 2.076 | 1.800 | 0.396 | 6.659 | 0.675 |
| 2.025 | 2.021 | 1.800 | 0.304 | 3.963 | 1.213 |



Comparison between Strength of critical SECTION OF XTUBE (SUPPORT) WITH

VARIOUS SECTIONS ALUNG TAPER. THE XTUBE WILL PAIL IN BENDING AT THE SUPPORT

BEFORE any section along the toper will fail, even with the devicted greek O.D. Mecsouromends

Siven it the above table. The M.S. is calculated as fallows:

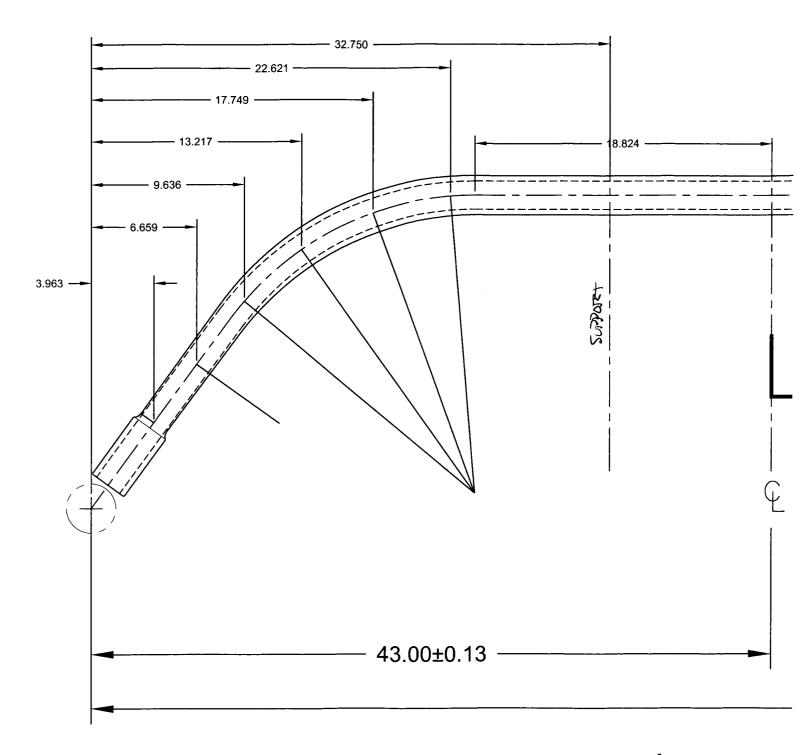
$$F^{2} \overline{\underline{\mathbf{I}}} = \frac{\mathbf{F} \cdot \mathbf{d} \cdot \mathbf{v}}{\underline{\mathbf{I}}}$$

$$MS = F_{1} - 1 = \mathbf{F} \cdot \mathbf{d} \cdot \mathbf{v} \cdot \mathbf{C} \cdot \mathbf{v} \cdot \mathbf{I} \cdot \mathbf{n}$$

$$\overline{\underline{\mathbf{I}}} \cdot \mathbf{v} \cdot \mathbf{d} \cdot \mathbf{v} \cdot \mathbf{C} \cdot \mathbf{v} \cdot \mathbf{I} \cdot \mathbf{n}$$

All margins are positive, or tube is sufficiently strong because locations with reduced O.D. are not critical.

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